

LETTERS

Physics Community Needs to Press Publishers to Get the Physics Right in Nonscience Texts

A troubling experience with the larger educational and training community prompts me to raise an issue that should be of concern to anyone who is a physicist, and especially anyone who teaches physics. By way of background, I am a physics professor at a two-year college, which means that physics education at all levels is my primary focus. As a person active in the local community, I am also an emergency medical technician, which is why, last fall, I registered for a course entitled Pre-

Hospital Trauma Life Support.

Upon opening the assigned textbook, I was surprised and pleased to see that the entire first chapter was entitled "Kinematics of Trauma." My first thought was that this could not be better! Here was the reality that physics educators, and two-year college educators in particular, have been preaching all these years: Everyone uses the principles of physics every day, so everyone should learn about them whenever possible.

So I eagerly opened to the first page of the first chapter and read that one of the chapter's objectives was to "define energy and force as they relate to trauma." Better and better, I thought, we are truly on our way! And we were. After only a page and a half, though, trouble began.

I had no problems with the authors giving Newton's first law of motion, which they presented very

well, but I was brought up short by their then skipping Newton's other two laws of motion in favor of stating the conservation of energy. And I couldn't fathom why they wanted to begin the topic with this question: "Why does the sudden starting or stopping of motion result in trauma and injury?" What puzzled me was their confusing discussion about energy, and their use of "deceleration" without bothering to define either it or "force."

Once over my initial dismay, I pushed on through the text, taking note of all too many physics mistakes. Following is just a sampling of what else I found.

After doing an injustice to the laws of motion, and without preamble, the book's authors (who shall remain nameless here) launch directly into a discussion of kinetic energy. Any reader who happens to teach freshman physics would probably be

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startled to learn that "the victim's weight and mass are essentially the same." Although the example then given nicely illustrates the relative effects of mass and speed on the calculated quantity of kinetic energy, the phrase following the example is likely to surprise, if not disturb, a physics teacher: "The method [kinetic energy] is used merely to illustrate the change in force." I for one remain baffled as to how to get a force from an energy. And if the authors want force, why oh why are they even discussing energy?

Later in the book, in a discussion about collisions, the authors reveal that the "differences in mass (weight) among occupants of the same vehicle have relatively little effect on their vulnerability to injury." And they cleverly proceed to discuss energy conservation without saying a word about momentum, which seems passing strange given that most collisions between a person's body and a moving automobile are inelastic, if not perfectly inelastic.

This textbook is rife with confusion, misstatement, error and omission in its presentation of physics concepts, even elementary ones, and it concerns me that such a volume is being used in the classroom. And I am perplexed as to how this particular one came to be written, published and made part of a course. Although I am likely to remain baffled on that score, I can report that I have expressed my views about the book's inadequacies to the publisher, and I have received word that my suggestions and comments will be taken under advisement.

I still think it is a wonderful idea to mention and use physics in such a setting and to give nonphysics students a grasp of some basic science concepts. I believe that authors, editors and publishers should be encouraged to support this effort by creating the appropriate teaching materials. I believe even more strongly, though, that they should be encouraged to do so *only* if they are willing to make sure they do it correctly.

If we in the physics community want the public to see our subject as accessible and useful, then we need to find ways to ensure that the subject is presented properly, if only by our exercising some effective oversight function. If we as professionals believe that this is an important issue, then we need to act collectively to make certain that publishers not only hear us but also listen to us.

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Scientists, not Spies, Called Key to Soviet Nuclear Arms Program

It has come to my attention that a particular sentence in my introduction to the special issue of *PHYSICS TODAY* on the early Soviet bomb secrets (November 1996, page 26) has been taken by some readers to mean that I have no respect for Soviet and Russian science. I would like to correct that impression.

A bitter dispute has taken place in recent years about the relative contributions of scientists and the intelligence services to the development of Soviet nuclear weapons. I wrote that this dispute raised a broader question: "Did Russian scientists make a real contribution, or is Russia condemned to a backwardness that it must constantly try to overcome by stealing or borrowing from the West?" What I had in mind—and thought was clear from the context—was that current and former intelligence operatives, by denigrating Soviet scientists and claiming to have obtained everything from the West, were indeed portraying Russia as backward. If some readers formed the impression that I share that view, I am happy to correct that misunderstanding here. I believe that the rest of the article, and my own study of the Soviet nuclear program,¹ point to the very high level of Soviet and Russian science.

Reference

1. D. Holloway, *Stalin and the Bomb*, Yale U. P., New Haven, Conn. (1994).

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Bright Future Seen as Possible for Digitized X-Ray Image Amplifiers

John Rowlands and Safa Kasap's article on digital x-ray imaging in your November 1997 issue (page 24) raises a question: What happened to image amplifiers? Developed by Varo Manufacturing Co (which made the light amplifiers for astronomy and the military) and by Westinghouse Electric Corp, they were neglected for a generation by the medical community. Then they suddenly became common at airports for x-ray checking of carry-on baggage when that lucrative market appeared. But they still seem to be neglected for medical use.



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